**Chapter 7 – Energy and Global Environmental Issues**

Forms and sources of energy:

1. Give an example of each of these forms of energy:
   a. Electromagnetic
   b. Nuclear
   c. Chemical
   d. Mechanical
   e. Thermal
2. Differentiate between potential and kinetic energy. Give an energy example of each one.
3. What drives the global geological cycle?
4. Where does the majority of energy for life on earth come from? What process fuels this?

The energetic basis of life:

5. Back to that water molecule: What makes it such an important molecule for energy transformation on earth?
6. What are the two primary pathways for the storage of sunlight energy on earth?
7. How are respiration and combustion related?
8. Discuss energy transformations in food webs in terms of efficiency.

Energy use by people:

9. At the current rate of consumption of fossil fuels, roughly how long can we maintain our contemporary lifestyles?
10. What are some advantages and disadvantages for each of the following energy source?
    a. Fossil fuels
    b. Nuclear power
    c. Geothermal
    d. Wood as energy source
    e. Solar
    f. Wind
    g. Hydroelectric
    h. Wave and tidal energy harvesting
    i. Ethanol

Global environmental challenges:

*Climate change* -

11. Discuss how the "greenhouse effect" works.
12. What are three greenhouse gasses, and how are they produced? Which has the greatest longevity in the atmosphere?
13. Where do we currently stand on climate change??
14. How is climate change affecting CA?
15. What does an early spring mean for plant and pollinator phenology?
16. What does sea level rise mean to coastal wetlands and the Central Valley?
17. Why are the poor disproportionately affected by climate change?
18. How will the Sierra snowpack impact our ability to mitigate and adapt to change?

*Ozone depletion* -

19. Issues relating to ozone
    a. Where do we want to find ozone?
    b. What agreement slowed the worldwide production of ozone depleting chemicals?
    c. How do we produce ground level ozone, and what are the impacts?

*Dead zones, fertilizers, and manure management* –

20. What causes "dead zones?" How can they be prevented or reversed?

*Agricultural issues* -

21. Why are California farms smaller than the average US farm? What is one of the leading threats to farms in CA?
22. How does CA water policy affect farmers and what impact do these policies have on ecosystems?
23. What threats do farms pose to salmon?
24. How can sustainable agriculture aid in healthier ecosystems?

25. How will climate change affect agricultural practices in the future?
    *Air quality* -
26. What are the pollutants of most concern in California, and what are their sources?
27. Why are we seeing higher levels of ozone pollution as our climate warms?
    *Solid Waste* -
28. What are problems associated with landfills? How can we mitigate some of these problems?
29. What is the most effective way to reduce our waste?
    *Population* –
30. As populations increase and change in California, how does this change our conservation concerns and potential for action?
31. Plastic gyres-what are they and how did they form? Include size, location and composition. How are they affecting pelagic birds and fish?

    **For discussion in class:** Climate change is severely impacting human and environmental health. Identify steps you are doing or planning to do to counteract its impacts. Do you have any big picture ideas to help curb climate change?